ASSET MANAGEMENT

PRESERVING OUR TRANSPORTATION INFRASTRUCTURE

2005 ANNUAL REPORT TRANSPORTATION ASSET MANAGEMENT COUNCIL

SUPPLEMENTAL: December 2006

PREFACE

"The department and each local road agency shall keep accurate and uniform records on all road and bridge work performed and funds expended for the purposes of this section, according to the procedures developed by the council. Each local road agency and the department shall annually report to the council the mileage and condition of the road and bridge system under their jurisdiction and the receipts and disbursements of road and street funds in the manner prescribed by the council, which shall be consistent with any current accounting procedures. An annual report shall be prepared by the staff assigned to the council regarding the results of activities conducted during the preceding year and the expenditure of funds related to the processes and activities identified by the council. The report shall also include an overview of the activities identified for the succeeding year. The council shall submit this report to the state transportation commission, the legislature, and the transportation committees of the house and senate by May 2 of each year."   MCL 247.659a(9)

A number of items that the Transportation Asset Management Council regularly reports on were not available at the time of printing for the May 2nd deadline. In the Annual Report the Council indicated that it would submit to the Legislature and the State Transportation Commission a supplemental report containing the additional information by the end of the year.

Federal-Aid System: National Functional Classification

The Asset Management Council reports information based upon National Functional Classification (NFC), rather than Act 51 Legal System. NFC is a planning tool used by federal, state, and local transportation agencies since the last 1960's. The Federal Highway Administration (FHWA) developed this method of classifying all roads according to their function. The NFC designation of a given road determines whether it is a federal-aid road and eligible for federal funds. The method establishes a hierarchical system consisting of arterials, collectors, and local roads.

    1. Arterials: Arterials are divided into subcategories of *principal* and *minor*. Principal arterials are at the top of the hierarchy. Principal arterials generally carry long distance, through-travel movements. They also provide access to important traffic generators such as major airports or regional shopping centers. These tend to be the most heavily traveled roads in an area. Examples of principal arterials include freeways, major U. S. routes, state trunk lines between large cities, and important streets in large cities. Minor arterials are similar in function to principal arterials, except they carry trips of a shorter distance and to lesser traffic generators. Examples include state routes between smaller cities, surface streets of medium importance in large cities, and important surface streets in smaller cities.

    2. Collectors: Collectors tend to provide more access to property than do arterials. Collectors also funnel traffic from residential or rural areas to arterials.   Examples of collector roads include county, farm-to-market roads, and various connecting streets in large and small cities.

    3.   Local: Local roads primarily provide access to property such as residential streets and lightly traveled rural roads.

2005 Bridge Condition

Bridges can be classified as "structurally deficient" or "functionally obsolete." These classifications are determined by the National Bridge Inventory database (NBI). A ***structurally deficient*** bridge is one in which at least one of the major structural elements (deck, superstructure, or substructure) has a condition rating of poor or worse. A ***functionally obsolete*** bridge is one that is not structurally deficient, but has deficient roadway width, vertical clearance, waterway, road alignment or load capacity. Federal law requires that bridges be inspected at least once every two years. There are 9 different categories which determine whether a bridge is classified as "deficient." Condition ratings are based on a 0-9 scale and assigned for the superstructure, the substructure, and the deck of each bridge. A condition of 4 or less classifies the bridge as being "deficient."

Structurally Deficient: Generally, a bridge is structurally deficient if any major component is in "poor" condition. If any one or more of the following are true, then the bridge is structurally deficient.

> ➤ Deck Rating is less than 5
> ➤ Superstructure Rating is less than 5
> ➤ Substructure Rating is less than 5
> ➤ Culvert Rating is less than 5
> ➤ Structural Evaluation is less than 3

Functionally Obsolete: Generally, a bridge is functionally obsolete if it is NOT structurally deficient AND its clearances are significantly below current design standards for the volume of traffic being carried on or under the bridge. More specifically, if the bridge is NOT structurally deficient AND any one or more of the following are true, then the bridge is functionally obsolete.

> ➤ Structural Evaluation = 3
> ➤ Deck Geometry is less than 4
> ➤ Underclearance is less than 4 and there is another highway under the bridge
> ➤ Waterway Adequacy = 3
> ➤ Approach Roadway Alignment is less than 4
> ➤ Waterway Adequacy is less than 3

A bridge cannot be classified as both structurally deficient and functionally obsolete. If a bridge qualifies for both, then it is reported as structurally deficient. While functionally obsolete bridges represent needed improvements if the overall system is to achieve maximum operating efficiency, the bridges rated as structurally deficient require more immediate attention.

The following table shows a comparison of the condition of the bridges on the federal-aid eligible system over the last 3 years. It should be noted that the

number of bridges rated each year fluctuates. This is due to the fact that inspections are done over a two year period.

ARTERIALS	2003	2004	2005
STRUCTURALLY DEFICIENT	680	664	502
Percent	9%	9%	8%
FUNCTIONALLY OBSOLETE	603	598	368
Percent	8%	8%	6%
GOOD CONDITION	2866	2871	2517
Percent	40%	40%	39%
COLLECTORS			
STRUCTURALLY DEFICIENT	421	447	452
Percent	6%	6%	7%
FUNCTIONALLY OBSOLETE	367	374	355
Percent	5%	5%	5%
GOOD CONDITION	2292	2232	2275
Percent	32%	31%	35%
TOTALS	7229	7186	6469

Investments in the System

MCL 247.659a(9) requires that the "department and each local road agency shall keep accurate and uniform records on all road and bridge work performed and the funds expended for the purposes of this section, according to the procedures developed by the Council. Each local road agency and the department shall annually report to the Council...the receipts and disbursements of road and street funds in the manner prescribed by the Council...."

Initially it was the intent of the Council to use the existing Act 51 annual financial reports for reporting this information to the Legislature. However, in reviewing recent Act 51 reports and the forms agencies use to file the required information, it was discovered that the data currently being reported does not allow expenditures to be categorized into various work improvement groups. Further, the data reported by city and county agencies is reported differently from the way MDOT reports its expenditures.

The Council needs information related to investments made in the preservation and improvement of pavements and bridges. They also need accurate information on routine maintenance. Currently, these expenditures are often included in other categories and cannot be deciphered independently. Further, the Council needs the information in such a manner as to be able to determine total expenditures for routine maintenance, capital preventive maintenance, and structural improvements, such as major rehabilitations and reconstructions. This cannot be done with the existing reporting forms. Consequently, the Council decided to establish its own reporting process. This process was initiated this last year.

Internet-Based Reporting Process: The Michigan Center for Geographic Information (CGI) has developed an Internet-based reporting tool to support the statewide asset management process. The tool is designed for road agencies to submit information on the work they have done during 2005 and any planned activities for 2006, 2007, and 2008. The tool allows any road agency to securely login to the application to enter information within their respective jurisdiction. If an agency does not have Internet access (and a surprisingly large number of smaller communities do not) authority can be given to another entity such as a regional planning agency.

The importance of this tool is that it gives all local and county road agencies, with Internet connection, a way to begin collecting this information without much technical or financial commitment. ***This information is a critical part of the overall transportation asset management process and is necessary for the Council to successfully carry out its legislative mandate.*** The information is used, along with the PASER road condition rating, to report to the Legislature, as required by law, and to predict future road condition.

In an effort to gain the greatest degree of compliance with the reporting requirements of MCL 247.659a(9), the Council held 13 training session around the state during the months of March and April. In addition, the tool was displayed at the Asset Management Conference held in May. Presentations were made to the Michigan Municipal League and the County Road Association of Michigan. Both of these groups sent notices to their members about the need to report the information to the Council. The tool has also been demonstrated at various asset management classes and Act 51 training sessions. Finally, reminders were sent to all regional planning agencies to contact the road agencies in their area and urge their compliance.

As of the first of October 2006, 269 out of 617 agencies or 43.6% were in compliance with the law; that is they had registered AND reported investment data for 2005. Another 173 agencies or 28% had registered but had not reported any data as required by the law. Finally, 175 agencies or 28.4% were in non-compliance. They had not reported nor even registered. While this number is significant in its size, the number of miles represented by these agencies is only 4.2%. Thus, 95.8% of the miles are currently covered by agencies that have either registered and reported or simply registered. In addition, over 70% of the miles are covered by agencies that have reported investments.

The following table reflects the data reported for work done in 2005.

2005 Road Investments		
	Miles	**Dollars**
Routine Maintenance	196.8	$4,049,760
Capital Preventive Maintenance	3,063.20	$130,466,417
Structural Improvement	1,471.5	$995,061,425
Totals	4,731.50	$1,129,577,602

We know this information is seriously under-reported as it represents only 44% of all agencies. And, for example, while we are reporting just over $1.1 billion in road investments, the amount reported by county road commissions in their financial reports was in excess of $800 million. That combined with MDOT's reported expenditures of $850 million clearly is greater than the total reported in the investment tool. In addition, there were a number of instances where local agencies reported only one project for the entire year. And while it may seem that work on 4,731.5 miles is a lot it represents only 5.6% of the total miles covered by the reporting agencies.

This is a serious issue for the Council because they have no way to enforce compliance, unlike if a city or county fails to file their Act 51 financial reports their Act 51 funds can be withheld until they do comply. ***This data is needed to both comply with the requirements of MCL247.659a and to run the models that project future condition levels.***

It should be understood that this is just the first year of this effort. It is a very difficult task to get all 617 agencies to submit information. The Council, however, believes that the efforts and results achieved were a good first step and will be working with all of the agencies to get greater compliance in 2007.

Development of Tools & Procedures

During the course of 2006 the Council began testing two models for use in projecting future road and bridge conditions: RoadSoft for the highway system and the Bridge Condition Forecasting System for bridges.

In October, the Model Analysis Team, a group of technical experts from MDOT, the Center for Geographic Information and Michigan Tech, met for two days in Houghton to test run the strategic model for highways. The test case was run using a select subset of the existing data base. The results showed a number of things. First, given the right data the model performs as expected. Second, the model is very data intensive and we discovered a number of gaps, especially at the local level, that will need to be closed before the model will be available for statewide analysis. This effort will be a top priority of the Council's in 2007.

In November, the Council's Data Management Committee saw a test run of the Bridge Condition Forecasting System. This model has been in use by MDOT to project the future bridge condition on the state trunkline system for a number of years. For this test run, data was entered for all federal-aid roads, using the National Bridge Inventory information. This model also performed as expected. Additional testing of various scenarios will take place during 2007.